

Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

In the Matter of )  
 )  
Appropriate Framework for Broadband ) CC Docket No. 02 -33  
Access to the Internet over Wireline Facilities )  
 )

DECLARATION OF DANIEL KELLEY

I. Assignment

1. I have been asked by WorldCom, Inc. (“WorldCom”) to comment on economic issues raised in the Wireless Broadband Internet Access Framework Rulemaking.<sup>1</sup> I conclude that due to Incumbent Local Exchange Carrier (“ILEC”) market power over facilities used by consumers to access the Internet, regulatory safeguards are required to ensure vibrant competition in downstream markets. Eliminating safeguards, either directly by inappropriate findings of non-dominance, or indirectly by defining services in such a way that they will not be regulated, will endanger competition in markets where competitors depend on input supplied by the ILECs.<sup>2</sup>

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<sup>1</sup> *In the Matter of Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, Universal Service Obligation of Broadband Providers, and Computer III Further Remand Proceedings: Bell Operating Company Provision of Enhanced Services; 1998 Biennial Regulatory Review – Review of Computer III and ONA Safeguards and Requirements*, CC Dockets Nos. 02 -33, 95 -20 and 98 -10, Notice of Proposed Rulemaking, 17 F.C.R. 3019 (2002) (“NPRM”).

<sup>2</sup> I have included in this Declaration sections from my Declaration in *the Broadband Dominance Proceeding, In the Matter of Review of Regulatory Requirements for Incumbent LEC Broadband Telecommunications Services*, CC Docket No. 01 -337, Notice of Proposed Rulemaking, 16 F.C.R. 22745 (“Broadband Dominance”).

## II. Qualifications

2. My current position is Senior Vice President of HAI Consulting, Inc. (formerly Hatfield Associates, Inc.). My professional experience began in 1972 at the Antitrust Division of the U.S. Department of Justice where I analyzed mergers, acquisitions and business practices in a number of industries, including telecommunications. While at the Department of Justice, I was a member of the U.S. v. AT&T economics staff.

3. In 1979, I moved to the Federal Communications Commission ("FCC" or "Commission") where I held several positions, including Special Assistant to the Chairman, Senior Economist in the Policy and Rules Division of the Common Carrier Bureau and Senior Economist in the Office of Plans and Policy. While at the FCC I was involved in both the Second Computer Inquiry and Competitive Carrier rulemakings. These two rulemakings considered the proper regulation of dominant telecommunications carriers. After leaving the FCC, I was a Project Manager and Senior Economist at ICF, Incorporated, a public policy consulting firm. From September 1984 through July of 1990, I was employed by MCI Communications Corporation as its Director of Regulatory Policy.

4. I conduct economic and policy studies on a wide variety of telecommunications issues, including local competition, dominant firm regulation, and the cost of local service. I have participated in most of the Commission's significant common carrier proceedings over the past 25 years, including the Third Computer Inquiry, Price Cap proceedings and proceedings involving the implementation of the

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*Proceeding*"), Declaration of Daniel Kelley, March 1, 2002, Attachment A to Comments

Telecommunications Act of 1996 (“1996 Act” or “the Act”).<sup>3</sup> My participation in these proceedings has generally been on behalf of new facilities-based entrants or Information Service Providers (“ISPs”) that compete with the ILECs or depend on ILECs for supply of critical inputs. I have prepared economic studies of the wireless industry and have analyzed several telecommunications mergers. I have advised foreign government officials on telecommunications policy matters and have taught seminars in regulatory economics in a number of countries.

5. I have testified on telecommunications issues before the Arizona, California, Colorado, Connecticut, Florida, Georgia, Hawaii, Maryland, Massachusetts, Michigan, Oregon, Pennsylvania, Utah and Washington Commissions, as well as the FCC and the Federal-State Joint Board investigating universal service reform.

6. I received a Bachelor of Arts degree in Economics from the University of Colorado in 1969, a Master of Arts degree in Economics from the University of Oregon in 1971, and a Ph.D. in Economics from the University of Oregon in 1976. My resume is attached.

### **III. Introduction and Summary**

7. I begin in Section IV by describing access to the Internet over wireline facilities. This requires an understanding of how the Internet operates and the roles played by various types of firms providing Internet services. The Internet is a dynamic, robust network whose successful development is in large part due to its open nature. No single firm dominates the Internet in the way that the ILECs dominate their local

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of WorldCom, Inc., filed March 1, 2002.

<sup>3</sup> Telecommunications Act of 1996, Pub.L.No.104 -104, 110 Stat.56, codified at 47 U.S.C. §§ 1-51 *et seq.* (1996).

telephony markets. Innovation takes place on an open platform that allows both large and small firms to introduce services and add functionality.

8. The Internet has developed as an open platform despite the fact that most consumers are connected to it through monopoly wireline facilities. Due to regulatory safeguards employed by the Commission and the courts, the monopoly over facilities used to connect consumers to the Internet has not interfered with its development. These regulatory safeguards would obviously be unnecessary if basic access to the Internet were as competitive as the other, unregulated, elements of the Internet. However, in Section V I show that robust competition has not developed for the facilities that provide consumers with access to the Internet. In particular, there is very little broadband service competition today. Digital subscriber line (“DSL”) services provided over the ILEC network are often the only broadband alternative available to consumers. In those areas where cable modem services are also available, there is a duopoly. In those extremely limited cases where both fixed wireless Internet service and cable modem service are available, consumers are limited to only three choices. As I discuss below, satellite services are an inferior option for most consumers.

9. There are even fewer competitive alternatives for many business customers. While there are a variety of services available for businesses to receive Internet access services (T1 services, Integrated Services Digital Network (“ISDN”) services, or asymmetric DSL (“ADSL”) based services, for example), for most business customers, the ILEC is the monopoly provider of the facilities needed to provide these services.

10. In Section VI, I describe the problems that may occur when firms with monopoly power participate in adjacent markets. For example, by raising rivals’ costs

monopolists can extend their monopoly into these adjacent markets. Monopoly results in higher prices, less diversity, and reduced innovation.

#### IV. The Internet

11. The Internet is simply a network of computers connected together through telephone lines and high-capacity transport networks.<sup>4</sup> The TCP/IP protocol allows the seamless exchange of data among the computers on the network. The primary uses of this network today are for electronic mail and the World Wide Web ("WWW"). The WWW allows Internet users to access and view or download any text, graphic, or video information that can be stored in or generated by a computer. All of the computers on the Internet, from the desktop or laptop machines in the home or office, to large servers run by content providers, must be connected to telecommunication transmission links that allow the data to be moved between computers.<sup>5</sup>

12. The basic architecture of the Internet is shown in Figure 1. Individual end users are typically connected to an e-mail server or the WWW through an ISP. Note that the link between consumers and the Internet is provided by the ISP. The ISP is connected to the remainder of the Internet through the Internet backbone. Data messages are transmitted across the Internet on competitive high capacity backbone networks provided by a number of carriers.

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<sup>4</sup>The ultimate deregulation of the Internet occurred in early 1990s when the government, which sponsored and built the original Internet, opened it up for commercial applications.

<sup>5</sup>For a historical perspective of the growth of the Internet see National Science Board, "Science and Engineering Indicators - 2000," Arlington VA: National Science Foundation, 2000 (NSB-00-1, pp. 9-6-9-10).

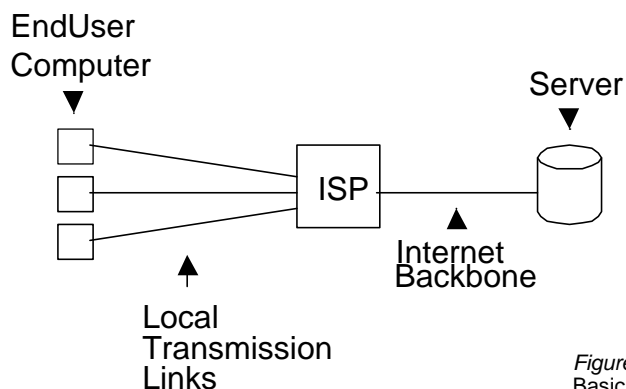


Figure 1  
Basic Internet  
Architecture

13. Links between end users, ISPs, and content providers range from dial-up telephony lines to high-capacity long-haul transmission facilities. In reality, of course, the architecture is much more complicated. For example, end user computers may themselves be used as Internet host servers, and ISPs may be content providers. ISPs and host servers are reconnected to the Internet backbone through a series of network access points.

14. Figure 2 shows the alternative ways in which end users may be connected to their ISPs and the Internet through their local telephone provider. Most connections are through modems connected to the same standard dial-up local telephone lines used for voice calls. Some subscribers might use the higher bit-rate ISDN lines. DSL services are an increasingly popular means of accessing the network. Large businesses might connect through dedicated T1 or even a DS-3 service at some of their locations.

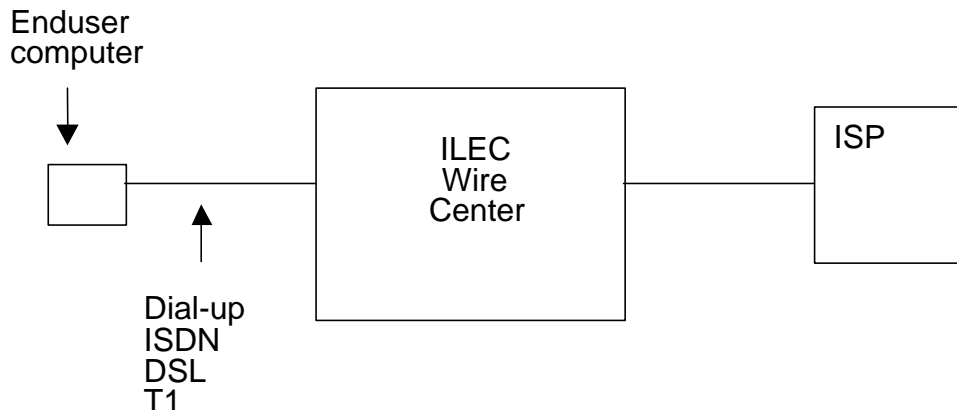


Figure 2  
Consumer Access to the Internet

15. In effect, the local portion of the Internet architecture is simply an overlay on the local telephone network. Rather than voice messages, the local network transmits data packets. From another point of view, the Internet is simply another service that rides on components of the local exchange network, just as local voice, long distance, fax, and other data services use the local network to a greater or lesser degree. As I discuss below, alternative local network alternatives are limited for most consumers.

16. In addition to the public Internet described above, a number of private “intranets” have developed. These consist of transmission facilities and routers carrying the data and e-mail traffic of large corporate customers. Intranet traffic generally does not make use of local telephone company switches, although intranets may be accessed remotely by employees working at home or traveling, in which case they would use local switched facilities.

17. The ISP function includes arranging for consumer access to the Internet through local links. The ISP bills consumers for the connection and provides customer

support functions. The ISP may also provide content and service such as customized webpages, web hosting, e-mail server provision, e-mail roaming, IP addresses (static or dynamic), access to domain name search and registration, browser and search engines, anti-spam software tools, Instant Messaging, streaming audio and video feeds, public radio station broadcasts, community bulletin boards and other local content, and technical seminars and workshops. These critical functions are now provided to consumers in a highly competitive market. Although the industry is experiencing consolidation, there are thousands of ISPs providing consumers with a wide variety of choices. Customers who are dissatisfied with the price or performance of their ISP service can easily find another alternative.

18. It is important to note that the data transport and ISP functions are separate. Nevertheless, broadband cable providers have bundled the transport and ISP functions. Although cable modem providers have in the past argued that technical barriers are responsible for this bundling, it is becoming apparent that this is not true. It appears that this limitation on consumer choice reflects the fact that suppliers of cable Internet services have market power. By controlling their customers' ISP services, the cable companies can limit the nature of the services their customers have available. In this way the cable companies can keep revenues for the whole range of ISP services listed above to themselves and prevent their customers from using Internet based services that might compete directly with their video or cable telephony offerings. <sup>6</sup>

19. It should also be noted that ILECs have bundled their ISP services with the underlying data transport in the sense that they offer DSL service to consumers that



includes both transport of the data and the ISP functions. In some cases, the ILEC provides the ISP functions itself. In others it deals with a preferred ISP.

20. ISP services, including those provided by ILECs are not regulated. The deregulation of these services was accomplished in 1982 in the Second Computer Inquiry (“Computer II”).<sup>7</sup> The basic premise of Computer II was that underlying transmission of information services was a monopoly, but the information services that ride on the monopoly facilities could be competitively supplied by non-regulated firms. It was necessary to separate the regulated basic and unregulated enhanced services in order to prevent the extension of the local telephone monopoly into enhanced services markets and to eliminate unnecessary regulation of competitive markets. The same principles were essentially adopted in the Modification of Final Judgment (“MFJ”) that settled the Government’s 1974 antitrust case against the Bell System.<sup>8</sup> The MFJ initially prohibited the Regional Bell operating Companies (“RBOCs”) from offering information services.

21. The Internet may also be usefully viewed as a “layered system.” As discussed in the Declaration of Ian T. Graham, a computer network can be usefully thought of as consisting of several layered functions.<sup>9</sup> The International Standards Organization (“ISO”) has developed a widely accepted seven layer Open System Interconnection (“OSI”) model. As Mr. Graham points out “the basic concept of the OSI model is that operations that take place at a certain layer depend upon the existence of the functions

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<sup>6</sup> Negotiating a few access arrangements with select ISPs does not alter the fundamental problem. Consumer choice of ISPs is limited by the cable company.

<sup>7</sup> *Amendment of Section 64.702 of the Commission’s Rules and Regulations*, CC Docket No. 20828, Final Decision, 77 F.C.C.2d 384 (1980) (*Computer II Order*).

<sup>8</sup> *U.S. v. American Telephone & Telegraph Company*, Modification of Final Judgment, 552 F.Supp. 131 (D.D.C. 1982) (“MFJ”).

<sup>9</sup> Declaration of Ian T. Graham on Behalf of WorldCom, Inc.

being performed at each lower layer, and that the protocols (rules for communications) at a given layer need not address all of the issues raised in the lower layers.”<sup>10</sup> This computer networking model, which applies to the Internet, allows efficient integration of many firms playing separate roles.

22. Table 1 shows a simplified four-layer version of the OSI model consisting of a physical layer, a logical layer, an applications layer and a content layer.<sup>11</sup>

Table 1

Content Layer – Web Sites
Applications Layer – Web Browsers
Logical Layer – TCP/IP Protocol
Physical Layer – Transmission Lines

23. The primary advantage of this network architecture is that it is open. The features and functions of the Internet are controlled at the edge of the network, where consumers and content providers are located. Because the transmission of information is governed at the logical level by the TCP/IP protocol, innovation and investment can take place in the other three layers independently of one another.<sup>12</sup> Content providers are not restricted by facilities providers, or vice versa. One does not need the permission of its telephone company to set up an Internet-based content business and multiple methods of, and technologies for, moving the content on the existing telephone are available.

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<sup>10</sup> *Ibid.*

<sup>11</sup> See Phil Weiser, “The Internet, Innovation, and Intellectual Property Policy,” forthcoming, and Kevin Werbach, “A Layered Model For Internet Policy,” J. TELECOM & HIGH TECH. L. \_\_, \_\_ (2002).]

<sup>12</sup> See Dale Hatfield, *Preface*, 8 COMM. L. & TECH. 1 (2000).

Consumers, of course, do not need to be concerned about these layers. The ISP provides the consumer with access to the content layer (third party websites and the like) using the logical, application and physical layers .

24. Certainly other models for organizing the Internet can be imagined. For example in the 1980s, the BOCs and their supporters argued that they should be allowed into information services markets because those markets would not develop without the economies of scale and scope that the BOCs could achieve through their vertical integration.<sup>13</sup> In 1987 the Department of Commerce claimed that “the full potential contribution of information services to the economy and national welfare cannot be achieved without allowing these [BOC] assets and resources to be mobilized.”<sup>14</sup> They were, of course, wrong. The open Internet is the opposite of the vertically integrated telephone model and consumers have reaped enormous benefits as a result. The ILECs have not played a major role in the development of services provided over the Internet and in my opinion the absence of monopoly interference from ILECs has contributed to the success of the Internet.

25. This market structure, including changes made in Computer II, the MFJ and the 1996 Act, has allowed the Internet to flourish. The entrepreneurial vision and innovations that created the Internet and the WWW succeeded in large part because the monopoly services on which the Internet applications ride were made transparent by

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<sup>13</sup> See, MFJ, 552 F. Supp. at 189, note 238. (Judge Green rejecting BOC arguments.)

<sup>14</sup> See Petition for Declaratory Ruling of the National Telecommunications and Information Administration, November 24, 1987, p. 9. Cited in Gerald W. Brock, Telecommunications Policy for the Information Age, 1994, pp. 234 - 235. Also see, *United States v. Western Electric Co.*, 714 F. Supp. 1, 3 (D.D.C. 1988), referencing arguments “advanced again and again that, if only the companies [BOCs] were allowed to enter the markets for broadband to them under the decree [information services], they would be able to innovate unlike independent corporations in the same markets...”

regulation. The ILECs were not allowed to limit who provided Internet services or how they were provided. As a result, tremendous innovation and investment took place at the edge of the network free from both government and monopoly control.

26. The structure redescribed above has generated proven benefits of large magnitude. The open structure of the Internet means that there is no compelling technical reason for eliminating the Computer II structure for regulating telephone company involvement in the Internet. Given the success of the Internet, changes should be made only after very careful consideration. A general bias in favor of eliminating regulation should not be used as justification for removing safeguards that have a proven track record. In other words, the Commission should follow the classic rule – if it ain't broke – don't fix it.

27. Potential competition from alternative platforms is not enough to justify changes. The ILECs have been arguing that local markets are competitive, or will be shortly, for twenty years. Their track record in this regard has been consistently poor.<sup>15</sup> Real and not imagined competition, or a relatively certain prospect for its development in a deregulated environment, is required as a basis for deregulation. If ISPs are denied effective transport access, then consumers will be at risk of losing the benefits ISP competition has brought to the market. If market forces are allowed to evolve free from monopoly interference, broadband will develop as and when consumer demand evolves.

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<sup>15</sup> Richard Chandler, A. Daniel Kelley and David M. Nugent, "The Technology and Economics of Cross-Platform Competition in Local Telecommunications Markets," HAI Consulting, Inc., April 4, 2002 ("HAI Report"), p. 5. A copy of this Report, which was filed with the Comments of WorldCom in the Triennial Review Proceeding, CC Docket No. 01-338, is attached to this Declaration.

## V. Physical Layer Competition

28. As noted above, most consumers connect to the Internet over narrow-band dial-up lines. Although the intent of the 1996 Act was to open local markets to competition, thus far little competition has evolved. As discussed at length in the attached HAI Report, cable and wireless alternatives to the local telephone network for narrowband services are extremely limited. Wireless service providers lack the capacity to supplant a significant amount of the traffic carried on existing local telephone networks.<sup>16</sup> Moreover, the limited quality and coverage provided by current mobile wireless services are a barrier to landline displacement.<sup>17</sup> Cable telephony is now available in some communities, but many cable providers are waiting for new technology to become available before offering the service.<sup>18</sup> We estimate that cable telephony is available to only 11 percent of households today.<sup>19</sup> Even where cable telephony is deployed today, consumers are left with a local telephone service duopoly. That is, choices will be limited and price competition will be, at best, muted because the two firms will be able to recognize their mutual interdependence or tacitly collude to maintain high prices.

29. Were the Commission's proposals in this Docket to be adopted, there would be room for much mischief. Could ILECs bundle ISP services with second lines and offer the bundle as an unregulated package? If so, this opens the possibility that ILECs

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<sup>16</sup> *Ibid.*, pp. 40-44.

<sup>17</sup> *Id.*, pp. 44-49.

<sup>18</sup> Limitations of the cable telephony business model, including competing investment alternatives and declining revenue streams due to rapidly falling long distance prices leave open the possibility that cable telephony may not become widely available. *Id.*, pp. 25-30.

<sup>19</sup> *Id.*, p. 23.

could discriminate against independent ISPs. The ILEC could effectively discount the cost of these second line and, given the lack of local competitive alternatives, place independent ISPs at a severe competitive disadvantage. It is difficult to imagine that this is what the Commission has in mind with its proposal. Therefore, the remaining discussion focuses on broadband access.<sup>20</sup>

#### A. Market Definition

30. Market definition exercises are useful only to the extent that they help shed light on the question of how regulatory changes, mergers or other business practices affect consumer welfare. Consumers want access to the Internet. But they also want ancillary services such as web hosting, e-mail hosting, specialized content and customer service. The fact that the underlying transport and ISP functions are bundled does not mean that they are in the same market. For example, carriers are bundling local service, vertical services, and long distance services, even though in the past the Commission has found that these services are in separate markets. For our purposes, it is useful to define a separate ISP market.

31. Although narrowband dial-up Internet access and broadband DSL-based Internet access utilize fundamentally the same local network facilities and infrastructure to allow consumers to reach a broad array of content and services from the Internet, many consumers do not consider narrowband to be an adequate substitute for broadband. Generally speaking, broadband services typically offer (1) always-on connections and (2) greater bandwidth capabilities, leading to (among other things) greater convenience and ease of use, higher download speeds, and a wider potential array of content. These

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<sup>20</sup> The lack of narrow-band local competition is dealt with in the HAI Report.

factors tend to have a significant impact on the consumer's use of the Internet. In addition, the prices for DSL -based Internet access are some 2.5 times greater than those for narrowband. In short, while the underlying network differences may in fact be negligible, broadband and narrowband access constitute two separate markets from the consumer's perspective.

32. The geographic dimension of the market is quite significant. The Commission has previously considered the broadband market as local. Consumers require service at their fixed locations. The availability of wireless on the other side of the hill, or cable in the adjacent community, is not a substitute for DSL at their residence. Therefore, the geographic scope of broadband service markets can be quite narrow.

33. DSL is currently offered in a radius around central offices equipped with DSL equipment and generally on all -copper loop only. DSL availability on digital loop carrier ("DLC") -served loops is possible, but has not yet been widely deployed. Cable modem services are typically offered on a system -by-system basis, and even then often on only certain parts of a system. Whether a particular system provides the service depends on whether the operator has invested the substantial amounts necessary to provide cable modem service. This means that in any given geographic locality, the options available to any given household will depend on the exact location of the household. It would typically be incorrect to define an entire region as a market and include both cable and DSL providers in it because many consumers would not have both technologies available. Some consumers might not have either.

**B. Broadband Service Competitors**

34. The next step is to evaluate the various technologies used to provide broadband services. Several technology platforms are being used to provide broadband service. Broadband service facilities are currently supplied by ILECs using DSL, cable companies using cable modems on upgraded cable plant, fixed wireless companies using multichannel multipoint distribution service (“MMDS”)/instructional television fixed service (“ITFS”), and Industrial, Scientific, and Medical (“ISM”) spectrum, as well as satellite providers. Each of these platforms is arguably in the relevant broadband service market.

35. Other technology platforms should not be included in the market. Mobile wireless companies do not currently supply broadband access and will not do so in the next few years. Firms providing fiber to the home (“FTTH”) service, which are essentially cable overbuilders, have an insignificant market presence today. Gigabit wireless technology using ‘pencil-beam’ waves in the upper millimeter-wave bands (frequency spectrum above 70 GHz) shows promise,<sup>21</sup> but widespread commercial deployment awaits Commission action on spectrum licensing. Moreover, the technology will likely be limited to commercial users.

36. Not all of the technology platforms included on the supply-side of the market are equal. Each technology has different quality and speed characteristics and each faces different economic challenges. Both satellite and fixed wireless broadband services have several limitations.

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<sup>21</sup> See, *Request for Amendment of the Commission’s Rules for the Point-to-Point Use of the 71.0-76.0 GHz and 81.0-86.0 GHz Bands*, Petition of Loec Communications, RM 10288.



37. Satellite service is available to consumers with generally southern exposure; i.e., no hills, trees, buildings, etc. in line-of-sight to the satellite. While there are currently two choices of satellite provider in many parts of the country, the service is significantly more expensive than either cable or DSL. Typical monthly rates are \$75.00 for a service that provides download at 400 - 500 kbps and upload at 128 kbps. This service is thus priced higher and provides lower quality than the other broadband services. A \$40.00 per month service is also available, but that requires upload through a separate dial-up telephone line at whatever modem speed is available over a switched telephone network connection.<sup>22</sup>

38. Costs of satellite installation are about \$500 - \$525 for equipment and \$200 for installation. The equipment, once purchased, belongs to the customer, but it can only be used for the satellite service for which it was purchased. In other words, the equipment is not interchangeable between satellite service providers. If the customer no longer wants the service, or wants to switch providers, he or she is stuck with the equipment. Professional installation is required, and a three - week wait for installation is typical. The high cost and delay associated with installation constitutes a significant barrier for most consumers.

39. These problems are reflected in the results of a recent survey conducted by PC World Magazine. PC World reports that "the run of the broadband litter has always been satellite. Characterized by difficult, expensive installations, notoriously poor service, and suspect performance, the service meant for anyone who can't get cable or DSL has ceased

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<sup>22</sup>See, Brad Grimes, "Ditch Your Dial -Up," *PC World*, February 2002, <http://www.pcworld.com/features/article/0,aid,73865,pg,3,00.asp>, viewed February 27, 2002 for a discussion of broadband service features and prices.

to be a serious option.” <sup>23</sup> In conclusion, it appears that satellite broadband is at best an alternative suited mainly for customers in rural areas or other areas where no other broadband alternative is available. <sup>24</sup>

40. While fixed wireless shows promise, it too faces significant limitations. Fixed broadband wireless systems, operating primarily in MMDS/ITFS and ISM spectrum, offer Internet access and other broadband data services to small to medium size businesses and residential customers in selected markets. These systems do not have the capacity to serve large fractions of the broadband demand in medium to large markets. Furthermore, current equipment used in these frequency bands requires line-of-sight paths between the system hub location and subscriber locations, further restricting the market they can serve. The implication is that the maximum penetration of fixed wireless services in larger markets will be limited to five to ten percent. <sup>25</sup> This upper bound on fixed wireless penetration obviously limits the competitive significance of the service. For these reasons, operators of such systems, including WorldCom, view their services as being complementary to DSL service instead of being indirect competition.

41. In the Commission’s *Broadband Dominance Proceeding*, a claim was made that “a major technology breakthrough for the large business market is the extension of Gigabit Ethernet to metro areas.” <sup>26</sup> As discussed in the HAI Report, ILECs have been

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<sup>23</sup> *Ibid.*

<sup>24</sup> Also see Jerry A. Hausman, J. Gregory Sidak, and Hal J. Singer, “Residential Demand for Broadband Telecommunications and Consumer Access to Unaffiliated Internet Content Providers,” *Yale Journal on Regulation*, Winter 2001, pp. 129 -173. (“Hausman, Sidak and Singer”), at p. 153.

<sup>25</sup> HAI Report, p. 78.

<sup>26</sup> *Broadband Dominance Proceeding*, John Haring & Harry M. Shooshan, “ILEC Non-Dominance in the Provision of Retail Broadband Services”, Attachment A to Qwest Comments, filed March 1, 2002 (“Haring and Shooshan”), p. 11.

making similar claims for new technologies for decades. It is premature to consider firms using this particular technology as significant competitors. Before there is significant deployment, this technology must be given the same weight as all of the other technologies that ILECs have claimed would bring competition to local markets, but never did. In any event, the applications appear to be limited to core urban areas because this last mile technology must connect to a broadband facility within one quarter of a mile of the radio. <sup>27</sup>

42. As noted above, many businesses face even less competition than residential customers. CLEC fiber ring facilities are limited to narrow geographic areas characterized by extremely high tele densities. Even within these areas it may be too expensive to extend facilities to many buildings. <sup>28</sup> Cable Modem service is generally not an option for many business locations. There are two reasons. First, cable systems typically do not pass business areas. Cable networks were constructed to provide cable television service to residential customers. Second, business users have reliability and security needs that cable modem service typically does not provide. <sup>29</sup> By contrast, ILEC copper networks are ubiquitous; their technology is inherently reliable and secure.

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<sup>27</sup> See, Adam Healey, "1000Base-T Technology Overview," Interoperability Lab, Gigabit Ethernet Alliance, November 19, 1998, presentation, viewed at <http://www.iol.unh.edu/training/ge.html>, April 18, 2001, for a discussion of transmission problems that arise at high frequencies on copper facilities.

<sup>28</sup> HAI Report, pp. 55-59.

<sup>29</sup> See *ILEC Broadband Services Notice*, Comments of Ad Hoc Telecommunications Users Committee, March 1, 2002 ("Ad Hoc Comments"), pp. 17-18.

CLECs, the primary business alternative, serve only a limited number of business locations.<sup>30</sup>

**C. The Extent of Current Broadband Service Competition**

43. The current level of competition, at least as measured by the presence of various competitors, is reflected in two recent government reports. The Commission's Third Report on the Deployment of Advanced Telecommunications Services shows that in almost half of the zip codes where broadband was available, there were only one or two suppliers.<sup>31</sup> Not all addresses within a zip code are actually eligible for service. A zip code is counted as having broadband availability if a service provider serves even one subscriber within the zip code. Therefore, even in the areas where there are more than two broadband providers, the number of consumers with access to more than two suppliers might actually be quite small. Moreover, suppliers reporting a presence in a zip code might well be dependent on ILEC facilities.

44. A recent survey conducted by the Department of Commerce's Census Bureau sheds more light on this issue. Of the survey respondents who use broadband Internet access, 97.5 percent reported using cable modem or DSL service.<sup>32</sup> The HHI implied by these data is 5,255, putting this market in the Justice Department's most highly

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<sup>30</sup>The BOCs report that CLECs serve only about 30,000 buildings with their own facilities. See UNE Fact Report, submitted in CC Docket No. 01-338, April 2002, p. IV - 4. There are hundreds of thousands of commercial locations.

<sup>31</sup> See, *In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate this Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, CC Docket No. 98-146, Third Report, 17 F.C.C.R. 2844, (2002) ("Third Report"), Table 9.

<sup>32</sup> Derived from Figure 4-1, p. 39 of U.S. Department of Commerce, "A Nation Online: How Americans Are Expanding Their Use of the Internet" (2002).

concentrated category.<sup>33</sup> These survey results show the bias in the Commission's methodology.<sup>34</sup> The reasons for the low share gained by other broadband services are discussed above.

45. Also as discussed above, broadband satellite is not a good substitute for most consumers, and fixed wireless rollout is questionable. In practice then, most consumers who have broadband service are using DSL or cable modems. Assuming that DSL and cable modems are the relevant alternatives, there are four possible states of the world: 1) no broadband competitor, 2) DSL only, 3) cable only, 4) both cable and DSL.

46. The Denver metropolitan area provides an interesting case study. The cable provider for much of the Denver metropolitan area is AT&T Broadband. However, at present, AT&T Broadband provides only limited cable modem service within the Denver city limits. In many of the newer Denver suburbs, DSL service is not available, or is only available at lower service quality levels, due to current limitations on DSL loop length. Sprint, the fixed wireless provider, is not marketing service to new customers at this time. Even if Sprint were actively seeking new subscribers, distance and line-of-sight limitations would severely restrict the market they could serve.

47. This pattern may be duplicated in other major markets. The core urban areas are likely to be served by cable plant originally constructed decades ago. Business districts may not be served by cable at all. The cost of upgrading the older plant to

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<sup>33</sup>Horizontal Merger Guidelines," U.S. Department of Justice and the Federal Trade Commission Horizontal Merger Guidelines (1992), issued April 2, 1992, revised April 8, 1997.

<sup>34</sup>Hausman, Sidak, and Singer agree that this market is highly concentrated. See Hausman, Sidak, and Singer, p. 154.

provide cable modem services is high.<sup>35</sup> In newer suburbs the cable plant is more modern and can be upgraded to provide cable modem services at a much lower cost. On the telephone side, the reduced cost of transport has led telephone companies to deploy DLC instead of adding new wire centers. As suburban areas have developed and grown, wire centers have not been added in the same proportion as lines, and ILECs typically extend service to these areas using DLC. Deployment of DSL over DLC is not widespread.

48. The implication is that significant numbers of consumers may have only one supplier, and in many cases that supplier will be an ILEC. Even in those cases where the consumer has both DSL and cable modem service available, the underlying broadband service competition is not likely to be robust. That is, the carriers may have significant market power. The inadequacy of facilities duopoly for ensuring consumer choice can be demonstrated in several ways. As a theoretical matter, duopoly is much more likely to lead to monopoly behavior. Game theory models show that when markets are occupied by a relatively small number of competitors, performance can suffer. In many models a competitive result requires several carriers to be in the market. The price-cost margin in the standard Cournot model of oligopoly interaction is inversely related to the number of competitors.<sup>36</sup> In other words, a duopoly in the broadband service market is not likely to perform competitively.

49. Game theory models typically assume that the competitors recognize their interdependence, but do not explicitly coordinate their behavior. This means that the resulting prices, while higher than the competitive level, may fall short of the monopoly

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<sup>35</sup> HAI Consulting, Inc., "Enduring Local Bottleneck II." April 30, 1997.

<sup>36</sup> See, e.g., W. Kip Viscusi, John M. Vernon and Joseph E. Harrington, Jr., *Economics of Regulation and Antitrust*, Third ed., 2000, p. 108.

profit maximizing level. By learning how to coordinate their actions, oligopoly firms may be able to raise prices above the Cournot level.

50. A number of factors facilitate the necessary coordination. The basic requirement, of course, is small numbers. In addition, if prices are visible to all the competitors, then cheating on any tacit agreement will be detected and therefore less likely to occur. Similarly, if the firms compete with one another in multiple markets, then they will be less likely to compete aggressively in any one of them due to the risk of retaliation.<sup>37</sup> Each of these facilitating factors is present in the broadband service business.

51. Among the harshest critics of oligopoly performance are the ILECs. They have been complaining about performance in the long distance market for years, sponsoring studies allegedly showing that this market performs poorly because it is concentrated.<sup>38</sup> I disagree with their empirical assessment. The long distance market has dozens of competitors in a nationwide market. Entry barriers are relatively low and prices have fallen substantially. However, the economic theory underlying these ILEC claims is incorrect. As Professor Jerry Hausman concludes, oligopoly facilitates

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<sup>37</sup> See, e.g., F.M. Scherer and David Ross, *Industrial Market Structure and Economic Performance*, 3<sup>rd</sup> ed., 1990, p. 315.

<sup>38</sup> See, Testimony of Jerry A. Hausman, on behalf of Pacific Bell (u1001) May 19, 2000, Before the Public Utilities Commission of the State of California, in re request of MCI Worldcom, Inc. and Sprint Corporation for Approval to Transfer Control of Sprint Corporation's California Operating Subsidiaries to MCI WorldCom, Inc. Application No. 99-12-012, p. 12. ("Hausman California Testimony"). See also, Application by New York Telephone Company (d/b/a Bell Atlantic - New York), Bell Atlantic Communications, Inc., NYNEX Long Distance Company, and Bell Atlantic Global Networks, Inc., for Authorization to Provide In-Region, InterLATA Services in New York, Declaration of Paul W. MacAvoy in Support of Bell Atlantic's Petition to Provide In-Region, InterLATA Telecommunication Services, CC Docket 99-295, September 1999.

coordinated interaction among competitors.<sup>39</sup> Given the high barriers to entry and the small number of competitors in broadband markets, performance by an unregulated oligopoly, particularly a duopoly of the ILECs and cable companies, can be expected to be poor.

52. There is empirical evidence from another telecommunications market that a duopoly does not provide competitive performance. Incumbent cellular providers, of which there were originally a maximum of two in each service market, argued that prices were competitive prior to entry by PCS carriers. However, pricing information collected by the FCC demonstrates that prices declined over 50 percent in the five years since PCS entry began in 1995.<sup>40</sup> It is reasonable to infer that the increase in competition when the market increased from two to as many as six or seven carriers was dramatic.

53. There would be less concern about a duopoly of facilities-based providers of broadband services if competitors wishing to offer a bundled local/long distance service could rely on non-discriminatory access to unbundled network elements to provide service to their customers. Unfortunately this is not the case. The ILECs are seeking an end to the requirement that they provide the UNEs that would enable firms to provide ISPs with alternate broadband services. The competitive broadband providers have obviously not

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<sup>39</sup> See, Hausman California Testimony, p. 12. Hausman points out that “the industrial organization literature has explored how, with only two firms, detection of cheating from an agreement is simplified.” Citing, A. Jacquemin & M. E. Slade, “Cartels, Collusion, and Horizontal Merger,” in R. Schmalensee & R. Willig, *Handbook of Industrial Organization* Chapter 7 (1989).

<sup>40</sup> *In the Matter of Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Service*, Fifth Report, 15 FCC Rcd 17660 (2000).



fare well in the market – a fact they have attributed to lack of cooperation from the ILECs.<sup>41</sup>

54. The fact that cable modem penetration is higher than DSL penetration does not mean that ILECs lack power in broadband service markets. Obviously, where cable is not provided, the ILEC is a monopolist. Where both cable and DSL are provided, both firms share in the market power.

55. Market conduct provides another indication that broadband service providers are capable of exercising market power. Broadband cable providers have bundled the transport and ISP functions forcing consumers who want to switch to broadband from narrowband to change their ISP (and e-mail address) or pay an additional fee to their old ISP. Although cable modem providers have in the past argued that technical barriers are responsible for this bundling, it is becoming apparent that this is not true; to the extent technical barriers exist, they can be overcome. In light of this, it appears that this limitation on consumer choice reflects the fact that suppliers of cable Internet services have market power. Another indicator of the market power held by some cable Internet providers is evident in AT&T's practice of blocking access to certain streaming video sites.<sup>42</sup> These sites are evidently viewed as a threat to AT&T's video programming business. In a competitive broadband marketplace AT&T would not be able to block access to streaming video, because it would lead to customer dissent and lost business.

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<sup>41</sup> See Shawn Young, "Covad, One of Last DSL Competitors, Blames Trouble on Bell Tactics," *The Wall Street Journal*, August 9, 2001, p. B1.

<sup>42</sup> See David Lieberman, "Media Giants' Net Change, Major Companies Establish Strong Foothold On -Line," *USA Today*, December 14, 1999. (Reporting comments by AT&T Broadband & Internet Services CEO Daniel Somers at the Paine Webber Annual Media Conference in Arlington, VA saying AT&T Broadband will not allow others to freely transmit movies and TV shows via the company's high-speed Internet connections.)

Finally, broadband service providers recently increased their rates, an uncommon step for competitive firms in high-tech markets.<sup>43</sup>

56. In the past, the Commission has justifiably required much greater showings of competition prior to removing safeguards. AT&T was subject to continuing regulation even after dozens of firms had entered the long distance market and achieved significant shares. Not until 1995, more than ten years after divestiture, was AT&T classified as a non-dominant carrier.<sup>44</sup>

57. In conclusion, broadband service markets are obviously not competitive. This situation is unlikely to change in the near term. Small numbers are the result of underlying market economics. Large economies of scale in wireline and cable networks and significant costs of expansion mean that the numbers of competitors will be limited. Significant numbers of consumers may be stuck with a monopoly provider, and many of those a monopoly DSL provider, for years to come. It is apparent that deregulating ILEC broadband services cannot be justified on the basis of robust competition, or even the near term prospect of such competition.

## **VI. Monopoly Leveraging**

58. Local telephone companies have not been shy about exercising their monopoly power in related markets. If broadband Internet access facilities are deregulated through reclassification, then a number of anti-competitive harms can be expected.

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<sup>43</sup>See, *Third Report*, para. 106.

<sup>44</sup>In the Matter of Motion of AT&T Corp. to be Reclassified as a Non-Dominant Carrier, FCC 95-427, Order, 11 F.C.C.R. 3271 (1995).

59. One consequence of deregulating ILECs' broadband Internet services would be that independent ISPs would not have guaranteed access to broadband facilities. With the ISPs and their current customers at the mercy of the ILECs, numerous anticompetitive strategies could be pursued. For example, "raising rivals' costs" strategies would successfully deter competition without the need to engage in even targeted price reductions.<sup>45</sup> Refusal to deal, degrading service, bundling and raising prices paid by competitors for essential ILEC inputs, thus placing them in a price squeeze, are all raising rivals' cost strategies. They effectively allow the incumbent to reduce competitor margins or increase barriers to entry without sacrificing revenue.

60. Refusing to sell broadband services to ISPs would obviously make it impossible for them to compete for the business of most customers. Degrading service, for example, delaying service installation, or giving lower priority to ISP service restoration in the event of an outage, would have the same effect in the long run. By charging the independent ISPs high prices for access to broadband facilities the ILEC can squeeze ISP margins and make competition impossible. As broadband technology changes, the ILEC could discriminate by denying or delaying ISP access to new network features and functions.

61. Using these tactics, ILECs could monopolize the ISP business in their territories. Absent regulation, ISPs would have little recourse. As discussed above, cable and other broadband alternatives do not provide a sufficient competitive alternative that would prevent this behavior. Antitrust cases are expensive to prosecute and slow to be resolved. Microsoft has been found guilty of engaging in monopoly leveraging tactics,

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<sup>45</sup> See Steven Salop and David Scheffman, "Raising Rivals' Costs," *American Economic*

but competitors maintain that these same tactics are still being used while the Courts decide on a remedy.

62. The ILECs have numerous powerful incentives to engage in this sort of anticompetitive behavior. First, it may be difficult to extract all of the available monopoly rents associated with customer demand for Internet services by simply raising the prices of the underlying transmission facilities. By driving rivals out of the ISP business, the vertically integrated ILEC could capture a larger proportion of total Internet related revenues and earn higher total profits.

63. Second, independent ISPs are in a position to provide their customers with services that are substitutes for traditional wireline services. For example, using Internet Protocol ("IP") Voice, the ISP could become a CLEC, arranging to provide its customers with high margin features such as voice mail, call forwarding, caller ID, etc., and become a direct competitor to the ILEC. By monopolizing the ISP business for broadband facilities, the ILEC can prevent this from happening. Similarly, if only the ILEC is marketing broadband service, then it will have control over whether the service is marketed as a replacement for its high margin dedicated access services, such as T-1s.

64. In effect, as long as it is not affiliated with the ILEC and has no market power of its own, an ISP has no incentive to defeat the open nature of the Internet. Quite the contrary, an unaffiliated ISP has every incentive to make the full power and potential of the Internet available to its customers. If the ISP fails to offer features and functions it will lose business to an ISP that does.

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*Review*, pp. 267 -271 (1983).

65. The competitive consequences of a less vibrant ISP business are obvious. ISPs provide consumers with a number of services. With less competition these services will be provided at a higher price and will not be provided as efficiently.

66. Moreover, there is likely to be less innovation if ILECs come to dominant additional layers of the Internet. Today innovation in the Internet takes place in each of the OSI layers discussed above more or less independently. As ILECs gain control over more than just the access facilities, independent sources of innovation will be threatened. Entrenched monopolists seldom make good innovators. Often they are more interested in protecting existing revenue streams than in exploiting new opportunities that might be created by technological change.<sup>46</sup> The best environment for innovation is often associated with “parallel innovation paths” – multiple firms trying different strategies.<sup>47</sup> This situation describes much of the current Internet, but would not describe a world in which ILECs have a stranglehold on Internet customers.

67. Content-based discrimination is another potential problem if the ILECs succeed in displacing competitors. Internet consumers use portals to reach web-based services and information sources. The ISP can channel consumers to particular services or sites in a number of ways. For example, they can speed access to favored sites, or even go so far as to block access to particular locations in order to steer consumers to affiliated vendors or content providers. Jerry Hausman, Gregory Sidak and Hal Singer provide an eloquent description of this problem:

“...an integrated provider could engage in content discrimination – insulating its own affiliated content from competition by blocking or

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<sup>46</sup> See, Scherer and Ross, p. 654.

<sup>47</sup> *Ibid.*, p. 644.

degrading the quality of outside content. Content discrimination could involve a range of strategies, from blocking outside content entirely, to affording affiliated content preferential caching treatment.<sup>48</sup>

As long as there is vibrant ISP competition, this is not a particularly serious problem.

However, if consumers are tied to the ILEC's ISP, then these sort of problems can emerge.

68. Raising rivals' costs will be the first choice of a dominant firm trying to protect its market position because such strategies generally do not entail the loss of revenue. However, strategic anti-competitive or even predatory pricing cannot be ruled out in these markets. Predatory pricing can be defined as pricing below marginal cost in order to deter entry or otherwise influence the ultimate structure of the market. Pricing below marginal cost will only be profitable if the losses can be recouped at a later time or, in the case of regulated firms, recovered from customers of other services through cost-shifting. Modern economic analysis shows that predatory pricing can be profitable in certain circumstances, for example when a multi-market firm faces entry in some but not all of its markets. Tirole provides the following example:

...suppose that an entrant enters (at some cost) into market 1. The incumbent, who is still a monopolist in market 2, may have an incentive to prey on the market 1 entrant to signal that his costs are low. Even if such a strategy does not induce exit (and thereby loses money) in market 1, it may prevent entry by another entrant (possibly the same firm) in market 2.<sup>49</sup>

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<sup>48</sup>Hausman, Sidak and Singer, p. 158.

<sup>49</sup>Jean Tirole, *The Theory of Industrial Organization* (1989), p. 376.

69. The best proof that something is possible is that it exists. Therefore, Tirole provides historical examples of successful predatory behavior in industries with high entry barriers.<sup>50</sup>

70. Weiman and Levin provide a historical example from the telecommunications industry. They studied the response of Southern Bell Telephone Company (“SBT”) to local competition at the turn of the 20th century, concluding that:

on balance, the evidence seems so overwhelming that SBT responded to competition by cutting its prices when entry was threatened, cutting them even further when entry occurred (or even somewhat in advance) and holding them below average operating cost for a sustained period.<sup>51</sup>

They go on to conclude that this behavior can only be categorized as “predatory” in nature.

71. The Commission has also recognized the danger of such strategic anticompetitive pricing:

If the incumbent is able to develop a reputation of aggressively competing via targeted bids with recent entrants by doing so in a handful of markets, it may be able to dissuade potential entrants from entering any of its other markets. Thus, the incumbent may protect its monopoly position in all of its markets by aggressively competing in markets where entry initially occurs.<sup>52</sup>

72. Tirole also discusses the classic predation theory in which a monopolist is able to outlast the entrant due to its superior financial strength. He points out that predatory behavior of this type “...relies on the presumption that outside financing is more costly

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<sup>50</sup> *Ibid.*

<sup>51</sup> Levin and Weiman, “Preying for Monopoly? The Case of Southern Bell Telephone Company, 1894 - 1912,” *Journal of Political Economy*, Volume 102, No. 1, February 1994, p. 113. (emphasis supplied)

<sup>52</sup> In the Matter of CC Docket No. 97-158, Southwestern Bell Telephone Company Transmittal No. 2633 Tariff F.C.C. No. 73, Order Concluding Investigation and Denying Application For Review, 12 FCC Rcd. 19311 (1997).

than inside financing (retained earnings).”<sup>53</sup> This “deep pockets” theory of predation is controversial and not widely accepted – in part because competitive capital markets should be willing to provide efficient entrants with financing. Nevertheless, there is no doubt that CLECs, in particular the smaller new entrants, have higher costs of capital than ILECs. If the ILECs were to use their contractual pricing authority to aggressively take business away from CLECs, venture capital firms and initial public offering (“IPO”) investors would likely respond by reducing the flow of funds to CLECs. Larger firms might not be affected in this way, but the long-term structure of the market could be adversely affected. Innovation is likely correlated with both the number and diversity of players.<sup>54</sup>

## VII. Conclusion

73. The deregulation of enhanced services that the Commission ordered in Computer II was predicated on the fact that regulation of basic monopoly services would ensure that enhanced service markets remained competitive and would not be subject to the monopoly leveraging described here. The promise of enhanced services competition made possible by the deregulation undertaken in Computer II is being realized. The promise of local competition made possible by passage of the 1996 Act just a few years ago has not yet been realized. Until that competition arrives, regulation of basic services provided by ILECs is required to maintain the benefits that are being realized through the growth and development of the Internet.

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<sup>53</sup>Tirole, p.379.

<sup>54</sup>See Scherer and Ross, p.654. (“Technical progress thrives best in an environment that nurtures a diversity of sizes and, perhaps especially, that keeps barriers to entry by technologically innovative newcomers low.”)



I declare under penalty of perjury that the foregoing is true and correct.

Executed on May 1, 2002.

/s/  
Daniel Kelley

**A. Daniel Kelley**

**PROFESSIONAL EXPERIENCE**

Senior Vice President, HAI Consulting, Inc., Boulder Colorado, current position.

Conducting economic and applied policy analysis of domestic and international telecommunications issues. Recent assignments include investigation of broadband competition and interconnection, antitrust analysis of local telephone company mergers, and costing and interconnection studies in various countries. Other assignments have included analysis of competitive conditions in wireless markets, the economics of cable television regulation, analysis of the prospects for local telephone competition, and measuring the economic cost of local service.

Director of Regulatory Policy, MCI Communications Corporation, 1984 - 1990.

Responsible for developing and implementing MCI's public policy positions on issues such as dominant carrier regulation, Open Network Architecture, accounting separations and Bell Operating Company line of business restrictions. Also managed an interdisciplinary group of economists, engineers and lawyers engaged in analyzing AT&T and local telephone company tariffs.

Senior Economist and Project Manager, ICF Incorporated, 1982 - 1984.

Telecommunications and antitrust projects included: forecasting long distance telephone rates; analysis of the competitive effects of AT&T's long distance rate structures; a study of optimal firm size for cellular radiomarkets; analysis of the FCC's Financial Interest and Syndication Rules, and competitive analysis of mergers and acquisitions in a variety of industries.

Senior Economist, Federal Communications Commission, 1979 - 1982.

Served as Special Assistant to the Chairman and during 1980 - 1981. Advised the Chairman on proposed regulatory changes in the broadcasting, cable television and telephone industries; analyzed legislation and drafted congressional testimony. Coordinated Bureau and Office efforts on major common carrier matters such as the Second Computer Inquiry and the Competitive Carrier Rule making. Also held Senior Economist positions in the Office of Plans and Policy and the Common Carrier Bureau.

Staff Economist, U.S. Department of Justice, 1972 - 1979.

Analyzed proposals for restructuring the Bell System as a member of the economic staff of U.S. v. AT&T; investigated the competitive effects of mergers and business practices in a wide variety of industries.

## EDUCATION

1976 Ph.D. in Economics                      University of Oregon  
1971 M.A. in Economics                      University of Oregon  
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## PAPERS AND COMPLETED RESEARCH

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